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CARBIDE AND CARBON CHEMICALS CORPORATION

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POST OFFICE BOX P
OAK RIDGE, TENN.

March 19, 1948

REPORT NO.

KZ 6564

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CENTRAL FILES

REC-44538

FILE

K-25

United States Atomic Energy Commission
Post Office Box E
Oak Ridge, Tennessee

Attention: Mr. J. C. Robinson

Dear Sir:

Reference: Development Program for Radioactive Particle Filters and
Chemical Warfare Service Participation in Waste Disposal,
Decontamination and Protective Program (Letter from
J. C. Robinson to C. E. Center, March 4, 1948)

As requested in your letter of March 4, 1948, the data concerning the
filter program is presented:

I. "A Summary with References of Information Applicable to this Problem"

A. Summary of Information on K-25 Filtering Problems

Interest in filters for removal of radioactive dust and toxic vapors
is confined to the following problems:

1. The exhaust from the product withdrawal room must be filtered to prevent contaminating adjoining areas with UF₆ vapors and UO₂F₂ dust in case of an accident. This filter, of the "Edgewood Arsenal" type has been in service for about five months. The effectiveness of this filter will be investigated. It is planned to use the same type of filter for these additional applications: Filtering exhaust air from the decontamination facilities, the radiochemical laboratory, and the UO₂ storage room. Data used in design of filter installations were obtained from the Chemical Warfare Corps, but no confirming data has been obtained at K-25.
2. There is an experimental program in progress for testing and developing a suitable gas mask for handling U Dusts. Tests have been made on U. S. Army cannister type gas masks for use with UF₆. Further tests are planned using HF and F₂ atmospheres.
3. There is an investigation in progress to determine the effectiveness of air samplers and small portable vacuum cleaners used for cleaning up contaminated equipment.

The references on these problems are presented in the attached
appendix.

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Carbide and Carbon Chemicals
Corporation, Operating Contractor for
the U.S. Atomic Energy Commission.

This document has been approved for release
to the public by: *W. L. Harwell* 4/19/96
Date
Technical Information Officer
Oak Ridge K-25 Site

Carbide and Carbon Chemicals
Corporation

W. L. Harwell - 6-16-59
6-24-59

W. L. Harwell

U. S. Atomic Energy Commission
Attention: Mr. J.C. Robinson

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March 19, 1948

B. Summary of Information on Y-12 Filtering Problems:

1. Filters are used to prevent valuable material from becoming air-borne and to recover valuable material from the air. This is affected by checking the air with air samplers (Filter Queen Vacuum type) and by use of various precipitating devices on the effluent air from the buildings. Types of precipitators used are: Cottrell and Precipitron (electric potential precipitators), and Roto-Clones (cyclone type with a water wash). The effectiveness of these filters is unknown and would bear investigation.

2. Tests have been run on various air sampling methods and a list of the reports on the work can be found in the attached appendix.

II. "Suggested Topics for the Meetings"

A. Purpose and necessity for research on filtering problems

1. A. E. C. facilities
2. Chemical Warfare Corp. facilities.

B. Review of problems from the viewpoint of Health Physics and Recovery of Valuable Material

1. Air Sampling - (using small vacuum cleaner)
2. Clean up of spills with vacuum cleaners
3. Filtering exhaust gases from laboratories, machine shops, etc.
4. Gas masks and respirators
5. Use of radioactive tracers in tests

C. Training Requirements

D. Coordination of problems between Army, A. E. C. and Contractors

E. Coordination of problems within Oak Ridge Area

III. "Suggested Program for Proceeding with the Training and Research"

A. Training

1. Courses in or review of the following would be desirable for those engaged in the projects (K-25 and Y-12 personnel have had this training).

- a. Health Physics
- b. Radiochemistry
- c. Nuclear Physics
- d. Engineering (filtering methods and equipment)

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Attention: Mr. J. C. Robinson

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March 17, 1948

2. Tours of inspection

B. Research Program

1. Literature survey.
2. Review of specific problems at each site.
3. Design and allocation of facilities.
4. Experimental Program on existing filter equipment at different sites.
5. Design and development of new filtering equipment for the specific problems found to exist.

IV. "Facilities available at your installation to carry out this program"

A. Facilities at K-25 where filters are used and tests could be performed

1. There is a complete set-up for testing gas masks with varying atmospheres in the K-25 Research Laboratories. This program could be expanded if necessary.
2. Tests could be run on available Furnace Stands to measure efficiencies of various types of filters for uranium dust.
3. Data on all filtering devices in use at K-25 for radioactive materials could be collected as necessary.
4. Installation of filters will be completed in the near future for exhaust gases from the Radiochemical Laboratory (α, β, γ), decontamination facilities (α), and the UO_2 storage room (α). Valuable experience will be gained from these installations.
5. Parts of the program on the design of filtering devices could be undertaken at K-25.

B. Facilities at Y-12 where filters are used and tests could be performed:

1. Building 9211 could be used to test filtering devices already installed. Specially designed stainless steel water-wash filters are available for the recovery of radioactive dust particles. Within the building are twelve (12) Cottrell Precipitators tied into the exhausts of twelve carbon burners and five (5) Cottrell Precipitators in the exhaust system of a battery of muffle furnaces. The exhaust from these electric precipitators (all of them being in series) is

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conducted through two type N Roto-Clones from whence it passes into the general ventilation system exhaust stacks. This type Roto-Clone cleans the air by a combination of centrifugal force and intimate inter-mixing of water and dust-laden air. It operates by the hydrostatic principle, using a stationary "impeller" with a sinuous passage through which air is passed at high velocity.

2. Facilities to test and develop air samplers and other small vacuum cleaners are available.

When Major Lewis and Mr. Beall arrive at Oak Ridge to discuss the filter problems, we will be pleased to participate and assist in any way possible.

Very truly yours,

Charles E. Center
Plant Superintendent

CEC:JLW:hm

Distribution:

Messrs. J. C. Robinson (4)

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March 19, 1948

REFERENCES Y-12

TL	INDEX	AUTHORS	SUBJECT	DATE
3437	Beta-31	R. C. Cummings	Filter Design for Beta Chemistry	3-15-44
4796	M-1553	H. E. Stokinger	Comparison of Relative Efficiencies of filter paper in sampling T dust. Final report.	5-20-44
5986	M-1580	H. P. Dygert H. Oberg H. E. Stokinger	Relative Efficiencies of the filter paper mask sampler and the glass electrostatic precipitator in determining the acceptability of respiratory protective devices in T-Dust atmospheres.	10-22-44
6274	C-2.381.8	R. M. Crane	Glass fiber filter "paper"	4-5-46
6842	C-2.320.6	R. M. Adams J. A. Rogers	Recovery of Tuballoy from Fiberglass Air Filters	8-5-46
8495	B-2.175.4A	A. C. Schmidt R. A. Leonard	Air-borne T Source data sheets for Vapor-phase Pilot Plant Equipment Room 51, Bldg. 9206	12-21-45
8596	B-2.175.5A	A. C. Schmidt R. A. Leonard	Air-Borne T source data sheets for the R.C. liquid-phase Chlorination equipment. Rooms 43,44 and 45, 47 Bldg. 9206	12-21-45
5827	B-2.175.6/a	A. C. Schmidt R. A. Leonard	Report of work done on the control of Air borne losses	1-11-46
5910	B-2.175.9/a	A. C. Schmidt R. A. Leonard	Control of Air Borne losses during the two week period 1-26-46.	1-29-46
8494	B-2.175.10/a	A. C. Schmidt R. A. Leonard	Air-borne T source data sheets - for the RO Calcination and Batching equipment in rooms 40,41,42, Bldg.9206	2-5-46
TEM 7888	B-2.175.14/c	R. G. Berggren	Studies of Air-Borne Uranium in Bldg. 9206	3-4-47
8929	B-2.175.15/c	D. J. Shrecengost R. G. Berggren	Air-borne Uranium at Y-12	1-20-47
6112	B-2.175.29/a	A. C. Schmidt R. A. Leonard	Report of work on the control of Air-borne losses during the interval from Jan. 26 to Feb 16, 1946	2-18-46

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U. S. Atomic Energy Commission
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March 19, 1948

REFERENCES Y-12 (Cont'd)

TL	INDEX	AUTHORS	SUBJECT	DATE
3170	B-2.175.30/a	A. C. Schmidt	Air-borne T Source Data Sheets for the carbon burning room on the second floor of Bldg. 9211	3-13-46
5321	G-1.133.3	S. B. Smith W. B. McPherson	Pilot scale collection and recovery of Air-borne tuballoy in Bldg. 9206	11-19-45
5409	G-1.133.4		Air-borne Tuballoy Dust Losses	11-20-45
8777	RM-9NG-14	R. Murray	Alpha Radioactivity Contamination of air in Bldg. 9212	12-11-46
10346	MDDC-471	H. M. Parker	Review of air monitoring procedures at Clinton Laboratories	11-19-47
5953	RL-4.9.16	H. F. Ballenger	Air-borne and short wave radiation hazards in the project at the University of California	1-31-46
7371	A-7.290.29	J. W. Morfitt	SHG Calculations for alpha particle MAC for uranium bearing air borne dust in Y-12	4-4-47
8447	Y-18	R. G. Berggren	Air-borne Uranium at Y-12, Third Revised Issue Chemical Div. Staff C&CCC, Y-12	8-12-47

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Attention: Mr. J. C. Robinson

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March 19, 1948

REFERENCES K-25

IH-3 Mask Testing; C. B. Yourn; Industrial Hygiene Section

Prod. Report of the Industrial Hygiene Section; N. H. Ketcham;
October and November 1947

Mask Testing Results January 1948; E. B. Olszewski;
(Letter to J. H. Bull)

Report of Trip to Medical Section, Rochester, N. Y., by
N. H. Ketcham, A-3680

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CARBIDE AND CARBON CHEMICALS CORPORATION
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Carbide and Carbon Chemicals
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the U.S. Atomic Energy Commission.

This document has been approved for release
to the public by: *W. L. Lawrence*
Technical Information Officer
Oak Ridge K-25 Site

W. L. Lawrence
6-24-59
6-16-59
W. L. Lawrence
6-24-59

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U. S. Atomic Energy Commission
Attention: Mr. J.C. Robinson

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